2002 Annual Compliance Report
Mexican Hat, Utah, Disposal Site

Compliance Summary

The site was inspected on September 9, 2002; overall, the site was in good condition and remains secure and protective. A severe summer storm event occurred the day before the inspection and runoff from adjacent lands damaged the riprap at the south end of the west diversion ditch. A follow-up inspection by a geotechnical engineer was performed to evaluate the extent of damage and provide a recommendation for repair. The bases of a perimeter sign and a boundary monument were eroded and will be repaired. All other improvements were in excellent condition.

Compliance Requirements

Requirements for the long-term surveillance and maintenance of the Mexican Hat, Utah, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I disposal site are specified in the *Long-Term Surveillance Plan for the Mexican Hat Disposal Site, Mexican Hat, Utah* (DOE/AL/62350–207, Rev. 2, U.S. Department of Energy [DOE], Albuquerque Operations Office, June 1997) and in procedures established by the DOE Grand Junction Office to comply with requirements of Title 10 *Code of Federal Regulations* Part 40.27 (10 CFR 40.27). These requirements are listed in Table 12–1.

Table 12–1. License Requirements for the Mexican Hat, Utah, Disposal Site

Requirement	Long-Term Surveillance Plan	This Report
Annual Inspection and Report	Section 3.1	Section 1.0
Follow-up or Contingency Inspections	Section 3.4	Section 2.0
Routine Maintenance and Repairs	Section 5.0	Section 3.0
Ground Water Monitoring	Section 4.3	Section 4.0
Corrective Action	Section 6.0	Section 5.0

Compliance Review

1.0 Annual Inspection and Report

The site, south of Mexican Hat, Utah, was inspected on September 9, 2002. Results of the inspection are described below. Features and photograph locations (PLs) mentioned in this report are shown on Figure 12–1. Numbers in the left margin of this report refer to items summarized in the Executive Summary table.

1.1 Specific Site Surveillance Features

Access, Fence, Gate, and Signs—The site, reached by a short dirt road from U.S. Highway 163, is on Navajo Nation land. DOE secured access to the site through a perpetual Custody Access Agreement signed by the Navajo Nation.

A high quality, barbed wire fence with a chain link entrance gate surrounds the site. A loose wire on the south fence was tightened; otherwise, the fence and gate were in excellent condition.

There are 43 perimeter signs and one entrance sign. All signs were legible. Although perimeter signs P24 and P26 have erosion at the concrete bases as noted in previous years, they remain stable. Perimeter sign P4 (PL–1) appeared unstable as approximately 3 feet of the concrete base was exposed and will be resecured or relocated.

Site Markers and Monuments—The two site markers, four survey monuments, 12 boundary monuments, and six settlement plates were in good condition.

Rocks had been placed over the permanent site marker on the cell but the marker was undamaged.

Boundary monument BM–11 (PL–2) is situated on a steep soil and rock slope, and soil has eroded from around the downhill side of the concrete base. The monument was stable but it will be resecured or reference monuments will be installed.

Monitor Wells—Monitoring of wells is not required by the Long-Term Surveillance Plan.

1.2 Transects

To ensure a thorough and efficient inspection, the site was divided into four areas referred to as transects: (1) the riprap-covered disposal cell top slope; (2) the riprap-covered side slopes and diversion ditches; (3) the area between the disposal cell and site boundary; and (4) the outlying area.

Top of Disposal Cell—The top of the riprap-armored disposal cell was in excellent condition. The inspectors saw no evidence of differential settling, cracking, erosion, or burrowing.

Side Slopes and Diversion Ditches—Inspectors saw no evidence of settling, slumping, or other evidence of instability on the side slopes of the disposal cell.

The sloughing of red country rock and soil along the south apron did not appear to have increased significantly during the past year; the accumulation remains approximately 18- to 24-inches high against the base of the vertical face of native rock. As in previous years, inspectors did not find evidence of channel erosion in this area, and the sloughed material does not appear to have filled the void spaces in the riprap beyond the toe of the slope. A baseline photograph (PL–3) was taken at a reference location established this year to determine trends. A photograph will be taken for the record annually until conditions stabilize.

A severe storm passed through the Mexican Hat area on September 8, 2002, causing water from
12A impervious areas south and west of the disposal cell to flow into the west diversion ditch. Municipal trash, tumbleweeds, and sediment were carried onto the site and became lodged in the security fence and diversion ditch riprap. Water depths in the ditch reached about 3 feet as indicated by the high water mark on the ditch sides. A 40-foot long by 3-foot wide section of

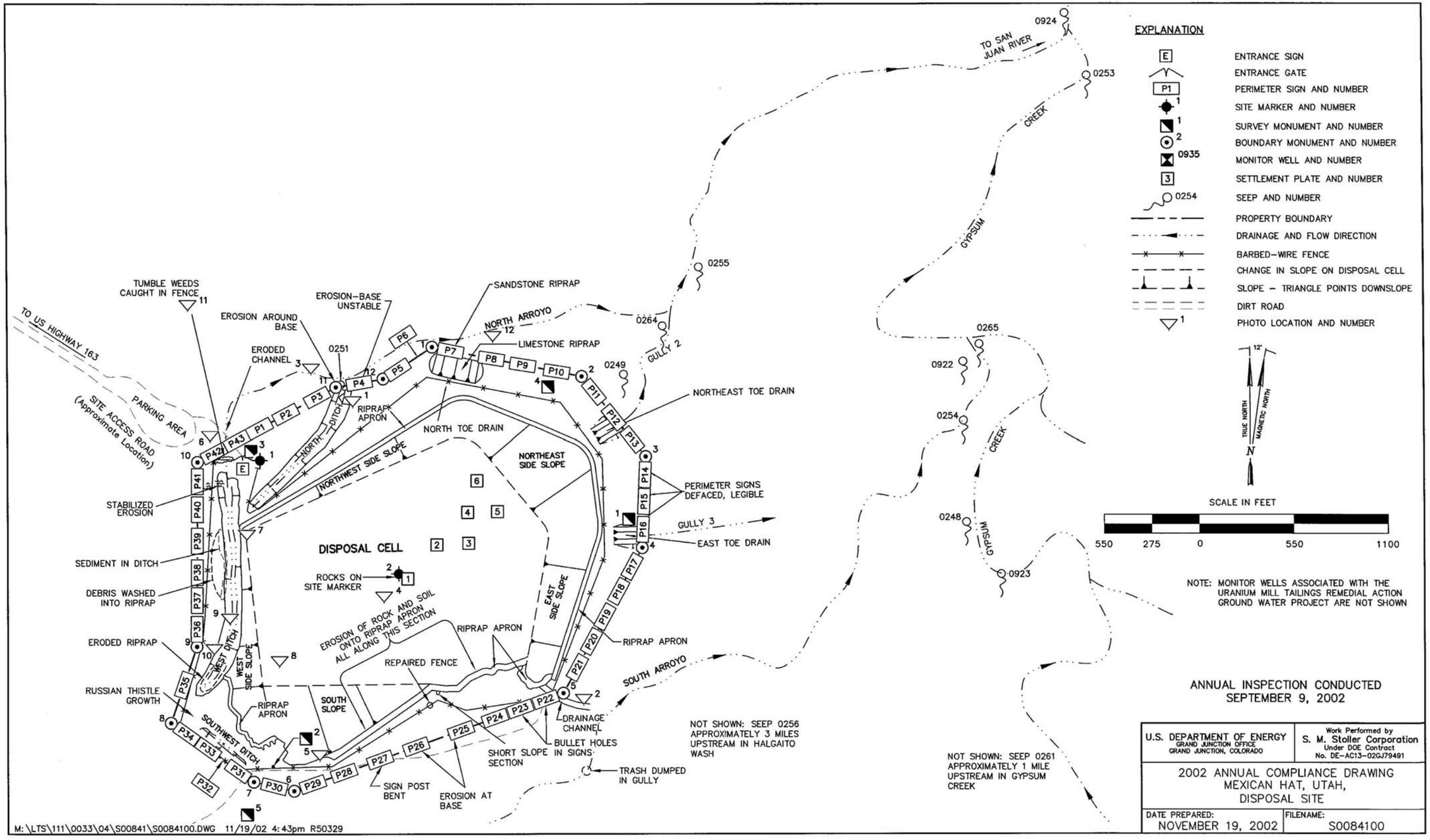

Figure 12–1. 2002 Annual Compliance Drawing for the Mexican Hat, Utah, Disposal Site

riprap at the south end of the ditch slumped to the bottom of the slope (PL–4). Erosion also occurred in the soft bedrock where the west ditch exits into the north arroyo. Inspectors saw no other evidence of creep, settling, erosion, burrowing, or other degradation in this transect.

Area Between the Disposal Cell and the Site Boundary—During the 2002 inspection, erosion previously noted near perimeter sign P41 appeared unchanged. The slope at this location is approaching a stable condition and intervention is not warranted. Other slopes around the disposal cell remain stable, with abundant rock exposures at the surface of the slopes and only minor accumulations of loose material or scree at the toe of the slopes. The only evidence of intrusion was the placement of rocks on the cell site marker.

Outlying Area—The area surrounding the site was visually inspected for signs of erosion, development, or other disturbance that might affect site integrity or security. Nothing appeared to have changed except for the debris left by the storm. Water was flowing from the riprap bordering the north arroyo and the seeps were covered with a thick layer of sediment.

2.0 Follow-Up or Contingency Inspections

12B A follow-up inspection by a geotechnical engineer was performed to evaluate the extent of damage caused by the storm. The recommendation is to rebuild the eroded portion of the diversion channel per original design.

3.0 Routine Maintenance and Repairs

Other than tightening a loose fence wire, no maintenance or repairs were conducted in 2002.

4.0 Ground Water Monitoring

Ground water in the uppermost aquifer is not affected by the cell or by historical processing activities because of an effective aquitard and an upward hydraulic gradient. Both of these characteristics prevent downward migration of water into the aquifer; therefore, monitoring of this aquifer is not required by the Long-Term Surveillance Plan.

Shallow ground water recharged by local precipitation is perched on top of the aquitard and emerges as seeps at several locations. Seep volume is low and does not constitute a water resource. The Long-Term Surveillance Plan requires annual monitoring of six seeps to assess disposal cell performance; however, DOE agreed to monitor all of the seeps shown on Figure 12–1 on a quarterly basis, when flowing sufficiently, since 1998 at the request of the Navajo Nation. Based on a seep assessment report sent to the Navajo Nation in April 2002, quarterly sampling was discontinued because there is no human health or ecological risk associated with exposure to the seep water. DOE will sample the six seeps identified in the
12C Long-Term Surveillance Plan (seeps 0251 and 0264 along North Arroyo, and seeps 0248, 0254, 0261, and 0922 along Gypsum Creek) in February 2003 in accordance with the Long-Term Surveillance Plan.

Results of quarterly sampling for three target analytes—nitrate, sulfate, and uranium—are shown on Figure 12−2 through 12−4. Maximum concentration limits of 44 milligrams per liter (mg/L) for nitrate (as NO_3) and 0.044 mg/L for uranium are established by the U.S. Environmental Protection Agency in Table 1 to Subpart A of 40 CFR 192.

Concentrations of nitrate have been variable in the two North Arroyo seeps for the past 3 years and have declined substantially from greater than 2,000 mg/L to less than 500 mg/L (Figure 12−2). Nitrate concentrations have remained relatively stable in the Gypsum Creek seeps for the past 3 years ranging from 150 to 400 mg/L. Concentrations in the background seep remain below 1.0 mg/L.

Sulfate concentrations similarly have decreased in the two North Arroyo seeps from greater than 6,000 mg/L to less than 4,000 mg/L (Figure 12–3). Concentrations in the Gypsum Creek seeps and the background seep have remained relatively steady between 3,000 and 4,000 mg/L during this time.

Concentrations of uranium in the North Arroyo seeps have decreased from greater than 2.0 mg/L to less than 1.0 mg/L since November 1999 (Figure 12–4). Concentrations remain relatively constant in the Gypsum Creek seeps at approximately 0.5 mg/L. Background levels at seep 0261 averaged 0.024 mg/L for the past 3 years.

Results of monitoring in 2002 show that concentrations of all target constituents are generally decreasing in the North Arroyo seeps and remaining relatively stable in the Gypsum Creek seeps. No trends of increase in concentrations are evident that would suggest degradation of the disposal cell cover.

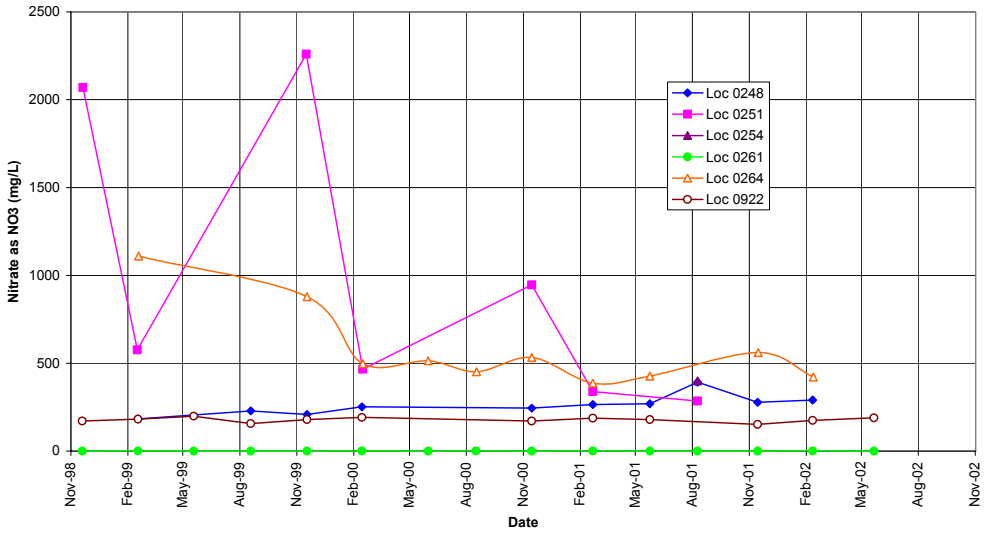

Figure 12–2. Time-Concentration Plots of Nitrate (as NO_3) in Seep Water at the Mexican Hat, Utah, Disposal Site

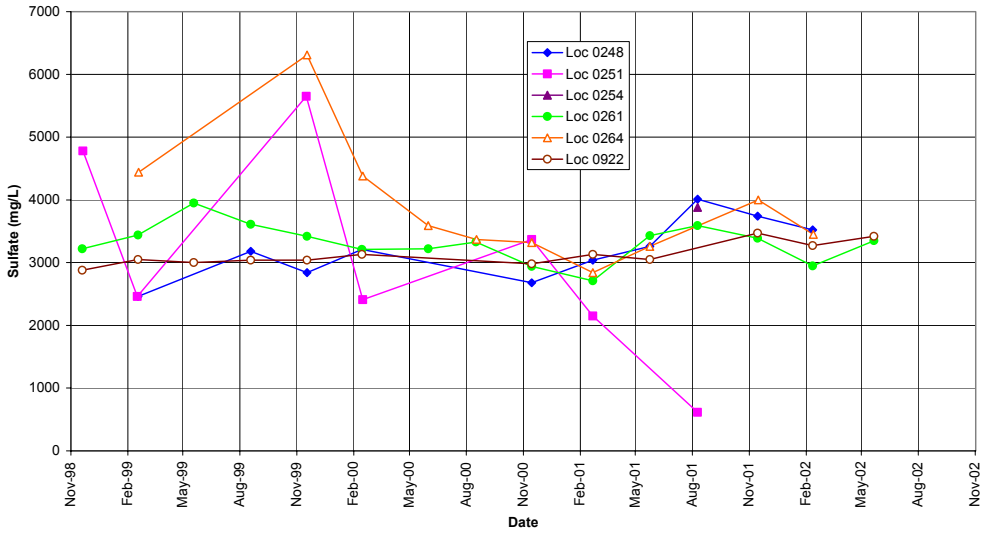

Figure 12–3. Time-Concentration Plots of Sulfate in Seep Water at the Mexican Hat, Utah, Disposal Site

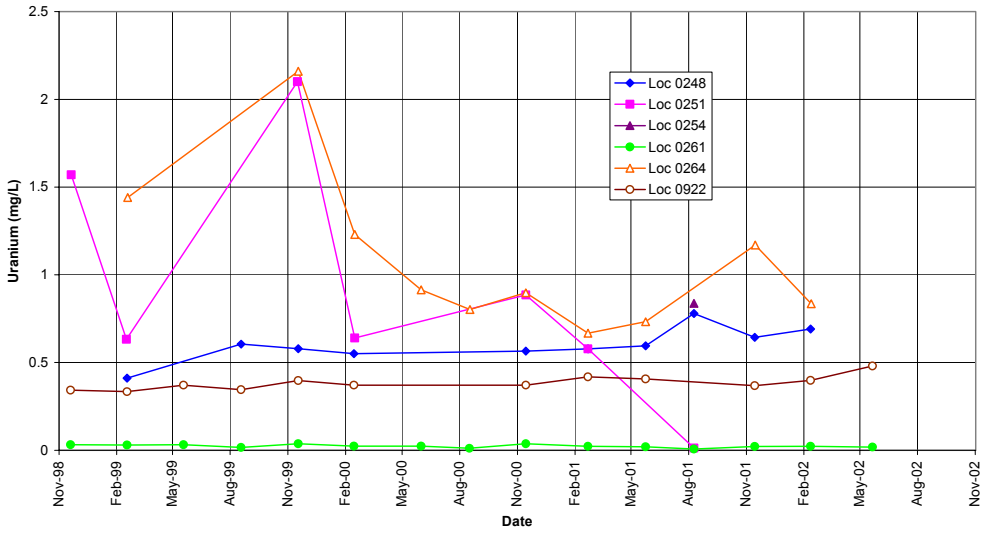

Figure 12–4. Time-Concentration Plots of Uranium in Seep Water at the Mexican Hat, Utah, Disposal Site

5.0 Corrective Action

Corrective action is action taken to correct out-of-compliance or hazardous conditions that create a potential health and safety problem or that may affect the integrity of the disposal cell or compliance with 40 CFR 192.

No corrective action was required in 2002.

6.0 Photographs

Table 12–2. Photographs Taken at the Mexican Hat, Utah, Disposal Site

Photograph Location Number	Azimuth	Description
PL–1	70	Erosion around perimeter sign P4.
PL–2	160	Erosion around boundary monument BM–11.
PL–3	0	Rock and soil accumulation on south apron.
PL–4	270	Rock that moved in the south end of west ditch during storm event.

PL–1. Erosion around perimeter sign P4.

PL–2. Erosion around boundary monument BM–11.

PL−3. Rock and soil accumulation on south apron.

PL–4. Rock that moved in the south end of west ditch during storm event.

End of current section